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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,085	07/24/2003	Dennice F. Gayme	H0005645- -1170	3521

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EXAMINER

MANCHO, RONNIE M

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,085

Applicant(s)

GAYME ET AL.

Examiner

Ronnie Mancho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-7,9-11,31,33,34 and 36-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-7,9-11,31,33,34 and 36-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 2, 12, 14-16, 18-20, 21-23, 25, 26, 28-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 9/14/06.
2. Applicant's election with traverse of 1, 5-7, 9-11, 31, 33, 34, 36-38, and species B in the reply filed on 9/14/06 is acknowledged. The traversal is on the ground(s) that the examiner had already examined all the claims in the case. Applicant's traversal is further on the grounds that the inventions are related, and further that the examiner did not establish reasons for insisting upon the restriction. This is not found persuasive because the examiner had pointed out that the species had acquired separate status in the art as indicated by the different patentably distinct embodiments disclosed in applicant's specification and drawings. It is also noted that applicant only argues that the inventions are related, applicant needs to either state that the inventions are patentably distinct or that they are Not patentably distinct.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

3. Claim1 is objected to because of the following informalities:

In claim 1, the applicant recites "residuals". In defining the term residuals, applicant's page 5, lines 4 and 5 recite" Generating *residuals can be accomplished* using a variety of techniques such as by comparing the sensor data to expected values and determining the *residual*

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difference". The definition is not clear because of the occurrence of "residual" in the disclosed "the residual difference". In the specification, applicant is advised to cancel "residual" in the disclosed "the residual difference" for clarity. Applicant is encouraged to make similar corrections in other parts of the specification.

Appropriate correction is required.

Specification

4. The disclosure is objected to because of the following informalities: In the specification, applicant is advised to cancel "residual" in the disclosed "the residual difference" for clarity. Applicant is encouraged to make similar corrections in other parts of the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 5-7, 9-11, 31, 33, 34, 36-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. In claims 1 and 31, the applicant recites "data type", it is not clear what all is meant and encompassed by the claimed "type". It is further not clear what all is meant and encompassed by "likelihood".

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Claims 11 and 38 recite, “processor further augments the sensor data by determining a margin “. On the other hand, applicant’s specification, page 5, lines 6-8, recites “determining rate of change of residual data **OR** determining margin levels”. There is no disclosure of “augments the sensor data by determining a rate of change of residual data AND further augments the sensor data by determining a margin” as recited in claims 1, 11, and 38.

In claims 11, 34, it is not clear what all is meant and encompassed by “a maximum safe temperature”. The phrase, “maximum safe” is indefinite in the claim. Therefore, the scope of “a difference between the exhaust gas temperature and a maximum safe temperature” is uncertain.

In claim 31, the applicant recites “a processor” and “a sensor data processor”. There is no distinction between the both processors in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 5-7, 9, 10, 31, 36, 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Scott (6098011).

Regarding claim 1, Scott (abstract, figs. 1, 2&7) discloses a fault detection system for detecting faults a turbine engine, the fault detection system comprising:

a sensor (A, B) data processor 36, 26, the sensor data processor receiving sensor data from the turbine engine and augmenting the sensor data to provide an augmented data set,

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wherein the sensor data processor augments the sensor data by generating residuals from the sensor data and determining a rate of change of the residuals; and

a fuzzy logic inference system 40, the fuzzy logic inference system receiving the augmented data set, and wherein the fuzzy logic inference system includes a plurality of membership functions, and wherein each of the plurality of membership functions is associated with at least one data type in the augmented data set, and wherein the logic system fuzzifies the augmented data set using the plurality of membership functions and analyzes the augmented data set to determine a likelihood that a fault (i.e. errors 28, 38; col. 3, lines 1-65) has occurred in the turbine engine.

Regarding claim 5, Scott discloses the system of claim 1 wherein the sensor data processor augments the sensor data by computing a margin for the sensor data.

Regarding claim 6, Scott discloses the system of claim 1 wherein the aircraft system comprises a turbine engine and wherein the sensor data comprises engine speed data, fuel flow data and exhaust gas temperature data.

Regarding claim 7, Scott discloses the system of claim 1 wherein the aircraft system comprises a turbine engine and wherein the sensor data processor receives exhaust gas temperature data and wherein the sensor data processor augments the exhaust gas temperature data by determining exhaust gas temperature margin data corresponding to a difference between the exhaust gas temperature data and a maximum safe temperature.

Regarding claim 9, Scott discloses the system of claim 1 wherein the fuzzy logic inference system includes a plurality of rules, and wherein the fuzzy logic system evaluates the fuzzified augmented data set according to the plurality of rules.

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Regarding claim 10, Scott discloses the system of claim 9 wherein the fuzzy logic inference system further aggregates outputs of the plurality of rules and defuzzifies the aggregated output for input into a diagnostic system.

Regarding claim 31, Scott (figs. 1-7, abstract, columns 2-8) discloses the apparatus comprising:

- a) a processor-,
- b) a memory coupled to the processor;
- c) a fault detection program residing in memory and being executed by the processor, the fault detection program including:

- i) a sensor (A, B) data processor 36, 26, the sensor data processor receiving sensor data from the turbine engine and augmenting the sensor data to provide an augmented data set, wherein the sensor data processor augments the sensor data by generating residuals from the sensor data and determining a rate of change of the residuals; and

- ii) a fuzzy logic inference system 40, the fuzzy logic inference system receiving the augmented data set, and wherein the fuzzy logic inference system includes a plurality of membership functions, and wherein each of the plurality of membership functions is associated with at least one data type in the augmented data set, and wherein the logic system fuzzifies the augmented data set using the plurality of membership functions and analyzes the augmented data set to determine a likelihood that a fault (i.e. errors 28, 38; col. 3, lines 1-65) has occurred.

Regarding claim 36, Scott discloses the apparatus of claim 31 wherein the fuzzy logic inference system includes a plurality of rules, and wherein the logic system evaluates the fuzzified augmented data set according to the plurality of rules.

Regarding claim 37, Scott discloses the apparatus of claim 36 wherein the fuzzy logic inference system further aggregates outputs of the plurality of rules and defuzzises the aggregated output for input into a diagnostic system.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 11, 33, 34, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott in view of Ling et al (5718111).

Regarding claim 11, Scott discloses the system of claim 10 wherein the aircraft system comprises a turbine engine and sensor data. Scott just mentioned a group of sensors generally sensing different parameters. Scott did not particularly mention the particular parameter sensed. However, Ling et al teaches of sensors in an aircraft turbine engine wherein the sensor data comprises exhaust gas temperature data, engine speed data, and fuel flow data, and wherein a sensor data processor augments the sensor data by generating residuals from the exhaust gas temperature data, engine speed data and fuel flow data and wherein the sensor data processor further augments the sensor data by determining a rate of change of the residuals, and wherein the sensor data processor further augments the sensor data by determining a margin for the exhaust temperature data corresponding to a difference between the exhaust gas temperature data and a maximum safe temperature.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Scott device as taught by Ling for the purpose of measuring or sensing particular parameters.

Regarding claims 33, 34, 38, Scott discloses the method of claim 12, but did not mention the particular parameters sensed by the sensors. However, Ling et al teaches the following:

In claim 33, sensor data comprises engine speed data, fuel flow data and exhaust gas temperature data;

In claim 34, sensor data processor receives exhaust gas temperature data and wherein the sensor data processor augments the exhaust gas temperature data by determining exhaust gas temperature margin data corresponding to a difference between the exhaust gas temperature data and a maximum safe temperature;

In claim 38, sensor data comprising exhaust gas temperature data, engine speed data, and fuel flow data, and wherein the sensor data processor augments the sensor data by generating residuals from the exhaust gas temperature data,

engine speed data, and fuel flow data and wherein the sensor data processor further augments the sensor data by determining a rate of change of the residuals, and wherein the sensor data processor further augments the sensor data by determining a margin for the exhaust gas temperature data corresponding to a difference between the exhaust gas temperature data and a maximum safe temperature.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Scott device (claims 15, 16, 20, 25, 26, 30, 33, 34, 38) as taught by Ling for the purpose of measuring or sensing particular parameters.

MPEP 2114

12. The statement of intended use or field of use, "wherein.....augments the sensor data by generating residuals.....and determining a rate of change of", "wherein.....fuzzifies the augmented data.....using a.....and analyzes the.....to determine a likelihood that a fault has occurred", "wherein.....augments the sensor data by computing", "wherein.....augments the exhaust gas temperature data by determining exhaust gas temperature margin.....corresponding to a difference between the", "evaluates the fuzzified augmented data.....according to", "aggregates outputs of.....and defuzzifies the aggregated output for" ".....augments by determining rate of change of", etc clauses are essentially method limitation or statement of intended or desired use. Thus, the claim as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See *In re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 512 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647. See MPEP § 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.

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Apparatus claims cover what a device is not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The prior art anticipate the structural limitations in the apparatus claims. Even if the prior art did not perform the method limitations recited in the apparatus claims, which the examiner is not conceding, it is believed that the structural arrangement in the prior art is capable of performing the method limitation recited in the apparatus claims.

Communication

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronnie Mancho whose telephone number is 571-272-6984. The examiner can normally be reached on Mon-Thurs: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ronnie Mancho
Examiner
Art Unit 3663

11/22/06


JACK KEITH
SUPERVISORY PATENT EXAMINER